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To: Public Health, Welfare and Safety Committee

From: Cliff Christian, Director of Governmental Affairs

American Heart Association

Subject: Support for SB 89 (Providing for breast feeding in the workplace

Lifestyle factors that increase the risk of heart disease in adults begin to take hold in childhood, and possibly even before birth, according to two studies reported in *Circulation: Journal of the American Heart Association.*

In one study, Boston researchers found that about two-thirds of 1,960 adolescents studied had at least one risk factor for heart disease, and almost 10 percent had a cluster of factors known as metabolic syndrome.

In the other study, British and Australian investigators looked at parental and early-life characteristics and their association with blood pressure in 5-year-old offspring. The children of women who smoked during pregnancy had higher blood pressure compared to children of nonsmokers, and parents' weight also influenced blood pressure. Breast-feeding was associated with a lower blood pressure.

Collectively, the findings suggest a need to start heart disease prevention efforts early in life, rather than after risk factors have become well established.

"The impact of these data may be far reaching," said lead author Sarah de Ferranti, M.D., M.P.H., in the cardiology division at Children's Hospital Boston. "[Medical] practitioners should be aware of the clustering of metabolic abnormalities in children, and affected children should receive risk-reducing interventions."

The metabolic syndrome is defined by the presence of multiple heart disease risk factors: impaired fasting glucose, high blood pressure, low HDL, elevated trigylcerides, and obesity (measured by waist circumference). A person who has at least three of the risk factors meets the criteria for the diagnosis of metabolic syndrome.

The metabolic syndrome has been studied extensively in adults, but far less in children and adolescents. Researchers adapted the criteria for adult metabolic syndrome to children, then applied them to participants aged 12 to 19 years in the third National Health and Nutrition Examination Survey (NHANES III), conducted between 1988 and 1994.

Overall, 63.4 percent of the children and teenagers had at least one metabolic abnormality, said senior author Nader Rifai, Ph.D. Nearly one-third (31.2 percent) of overweight/obese adolescents had the metabolic syndrome.

The most common risk factor was a low level of HDL (good) cholesterol, seen in more than 40 percent of boys and girls. About 30 percent of adolescents had elevated levels of triglycerides, another type of blood fat, and between 20 percent and 30 percent of adolescents had a waist circumference that met the definition of obesity. Additionally, 9.2 percent met the criteria for metabolic syndrome (three or more risk factors), which occurred almost equally in boys (9.5 percent) and girls (8.9 percent), and in older (8.3 percent) and younger (10.3 percent) adolescents.

The distribution of metabolic syndrome by ethnic group was Mexican-Americans – 12.9 percent, non-Hispanic whites – 10.9 percent, and non-Hispanic blacks – 2.5 percent. These percentages for adolescents are similar to those reported in adults from the same ethnic groups.

Because metabolic syndrome is closely related to diabetes and obesity, the "results are not surprising in view of the high and rising rates of obesity and type 2 diabetes mellitus in U.S. children," de Ferranti said.

In the second study, Debbie A. Lawlor, M.B., Ch.B., Ph.D., consultant senior lecturer in epidemiology, department of social medicine, University of Bristol, United Kingdom, and colleagues, reviewed parental and early-life factors that influenced blood pressure in children at age five. Interest in blood pressure at such an early age comes from the recognition that high blood pressure is a major risk factor for heart disease, and blood pressure in adults tends to follow the same pattern seen in childhood. Previous studies of blood pressure in childhood have tended to involve relatively few children, used different types of study designs and produced inconsistent results.

The study involved more than 8,500 Australian women and their offspring enrolled in the Mater-University (Queensland, Australia) study of pregnancy and outcomes. The investigators evaluated a variety of variables for their potential influence on childhood blood pressure. The factors included ethnicity, smoking history, mother's height and weight, father's body mass index, family education, income and a variety of other factors. At age five, 3,864 offspring were examined.

Children of women who had smoked throughout pregnancy had a systolic blood pressure (the first number in a blood pressure measurement) that was about 1 millimeter of mercury (mm Hg) –or point – higher at age five, compared to children whose mothers did not smoke during pregnancy. A comparison of women who quit smoking during pregnancy with those who continued suggested that quitting during pregnancy could prevent the adverse effect on offspring blood pressure.

A mother's age was associated also with higher blood pressure. A child's systolic blood pressure was 0.7 mm Hg higher for every additional five years of age in women at the time they gave birth, Lawlor said.

Breast-feeding for at least six months was associated with lower blood pressure. Other factors associated with blood pressure were the mother's weight and height, the father's weight, and the child's weight, height, and body mass at age five.

The findings have implications for childhood prevention strategies that might yield benefits into adulthood, the investigators concluded.

"Since childhood blood pressure tracks into adulthood, interventions aimed at early life risk factors – quitting smoking during pregnancy, breast-feeding, prevention of obesity in all family members – may be important for reducing the population distribution of blood pressure, and thus cardiovascular disease risk," said Lawlor.

De Ferranti's and Rifai's co-authors are Kimberlee Gauvreau, Sc.D.; David S. Ludwig, M.D.; Ellis J. Neufeld, M.D., Ph.D.; and Jane W. Newburger, M.D., Ph.D. This study was partly funded by the National Institute of Diabetes and Digestive and Kidney Diseases.

Lawlor's co-authors are Jake M. Najman, M.D.; Jonathan Sterne, Ph.D., B.Sc.; Gail M. Williams, Shah Ebrahim, M.D.; and George Davey Smith, M.D

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At-a-Glance: American Heart Association's Dietary Recommendations for Children and Adolescents

Here is a summary of key American Heart Association dietary recommendations for preventing the development of cardiovascular disease from infancy and childhood.

Start in infancy.

- ***If possible, feed breast milk exclusively for the first four to six months and continue breastfeeding until one year of age.***
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- **Delay introducing juice until at least six months of age and then use only 100 percent juice and limit to no more than 4-6 oz. per day. Only feed juice from a cup.**
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- Introduce healthy foods and continue offering if initially refused. It may take up to 10 tries for a baby to accept a new healthy food.
- Do not introduce foods without overall nutritional value simply to provide calories.
- Respond to cues the baby is full and do not overfeed. Do not force children to finish meals if not hungry.

Serve foods with high nutrition.

- Serve whole grain breads and cereals rather than refined grain products. Look for "whole grain" as the first ingredient on the food label and make at least half your grain servings whole-grain. Recommended grain intake ranges from 2 oz. per day for a one-year-old to 7 oz. per day for a 14-18 year old boy.
- Serve a variety of fruits and vegetables daily, while limiting juice intake. Each meal should contain at least one fruit or vegetable. Children's recommended fruit intake ranges from 1 cup per day, between ages 1 and 3, to 2 cups for a 14-18 year old boy. Recommended vegetable intake ranges from ¾ cup a day at age one to 3 cups for a 14-18 year old boy.
- Introduce and regularly serve fish as an entrée. Avoid commercially fried fish.
- Serve non-fat and low-fat dairy foods. From ages 1-8, children need 2 cups of milk or its equivalent each day. Children aged 9-18 need 3 cups.
- Don't overfeed. Estimated calories needed by children range from 900 per day for a 1-year-old to 1800 for a 14-18-year-old girl and 2200 for a 14-18-year-old boy.
- Keep your child's activity level in mind. Be physically active for at least 60 minutes day.

Reduce "empty" calories.

- Make foods with high calories and little nutritional value an occasional discretionary item in a diet otherwise based on nutrition-rich foods.
- Reduce intake of sugar-sweetened beverages and foods.
- Reduce salt intake in processed and home-cooked foods.
- Choose cereals, breads, and prepared foods containing whole grains and higher fiber and with low salt and sugar.
- Reduce intake of high-calorie, nutrient poor foods such as salty snacks, ice cream, fried foods, cookies and sweetened beverages.
- Limit snacking during sedentary activities or in response to boredom.
- Restrict the use of juice, soda, and sports drinks as snacks.

Reduce saturated fats and trans fats.

- Use non-fat (skim) or low-fat dairy products for all family members.
- Serve only lean cuts of meat.
- Limit fried foods.
- Use vegetable oils and soft margarines low in saturated fat and trans fatty acids instead of butter or other animal fats.
- Remove skin from poultry and visible fat from meat before eating.
- Use canola, soybean, corn, safflower, olive or other unsaturated oils in place of solid fats when preparing food.
- Limit sauces high in fat and calories, such as Alfredo and hollandaise, cream and cheese sauces.
- Serve more fish more frequently, especially oily fish that contains heart-healthy omega-3 fatty acids (such as salmon and tuna). Bake or broil fish instead of frying.
- Serve some entrees based on legumes, beans or tofu instead of meat.

Foster a physically active lifestyle.

- Encourage 60 minutes of moderate to vigorous play or physical activity daily.
- Limit time in front of television or computer to no more than one to two hours per day.
- Don't put a television set in a child's bedroom.
- Provide opportunities for children to participate in sports.
- Encourage schools to provide opportunities for both competitive and noncompetitive sports.
- Participate in regular daily physical activity yourself and promote active family recreation.
- Encourage outdoor play whenever possible.

Promote healthy eating behaviors for the whole family.

- Have regular family meals.
- Parents should choose meal times, not children.
- Keep the kitchen stocked with a variety of nutrient-dense foods, such as fruits and vegetables, instead of high-calorie/nutrient poor foods such as salty snacks, ice cream, fried foods, cookies, and sweetened beverages.
- Serve portion sizes appropriate to a child's size and age (for example, a one year-old toddler only needs two ounces of grains a day).
- Parents need to show children how to be healthy by eating properly and making regular exercise important in their lives.

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